



TRICARE Data Quality Training Course

September 2011



DHSS Supports Enterprise-Wide Data Quality Efforts



Objectives

- Why data quality matters
- How our tools affect data quality
- How you can use this information in your data quality program

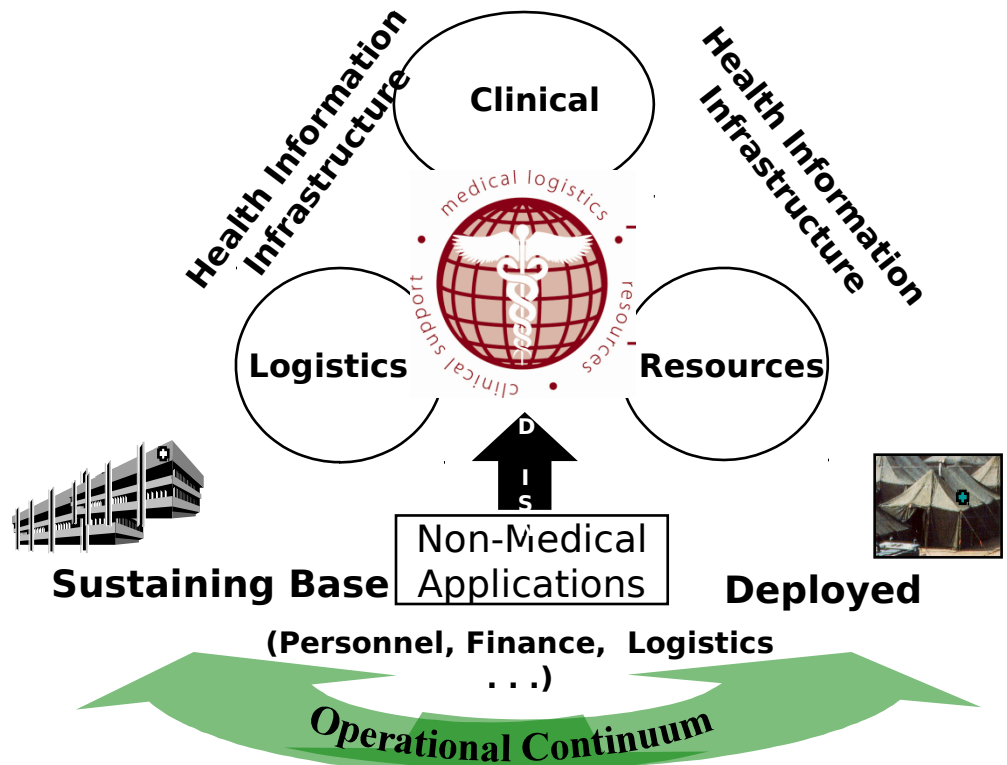
DHSS

- MHS centralized data store
- Receive, analyze, process, and store 100+ terabytes of data
- Thousands of users worldwide

What is DHSS?

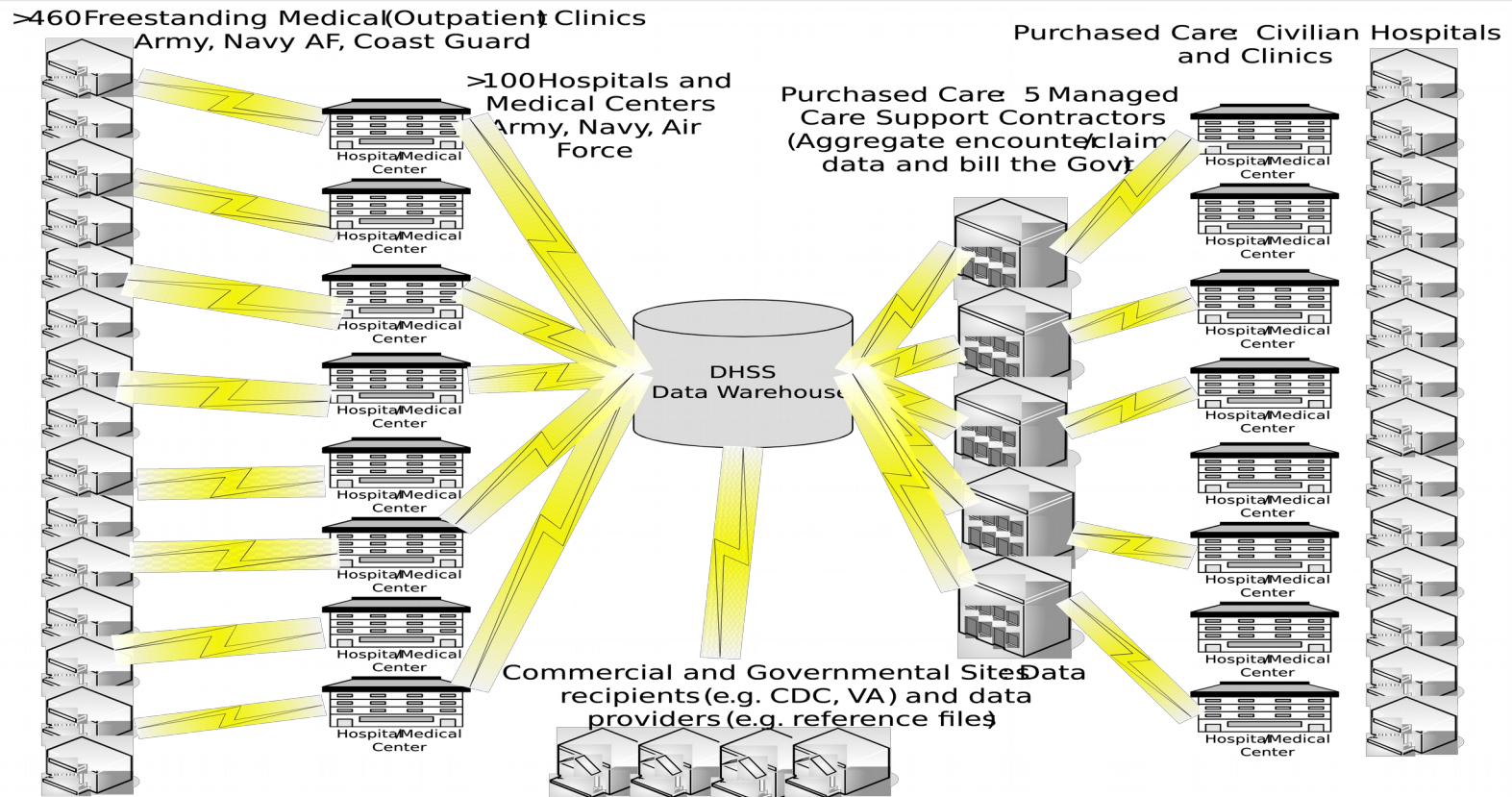
40,000 Foot

- TRICARE decision support that makes the vision of the Military Health System Plan possible
- Military Health System technology that integrates and standardizes clinical, resource, population, logistics, and other referential information



What is DHSS?

20,000 Foot View



> 10 Million Beneficiaries

Direct (Military Provided) Care:	Inpatient: 250,000 Annually Outpatient: 30 Million Annually
Purchased (Civilian Provided) Care	Inpatient Claims: 800,000 Annually Outpatient "Claims": 100 Million Annually

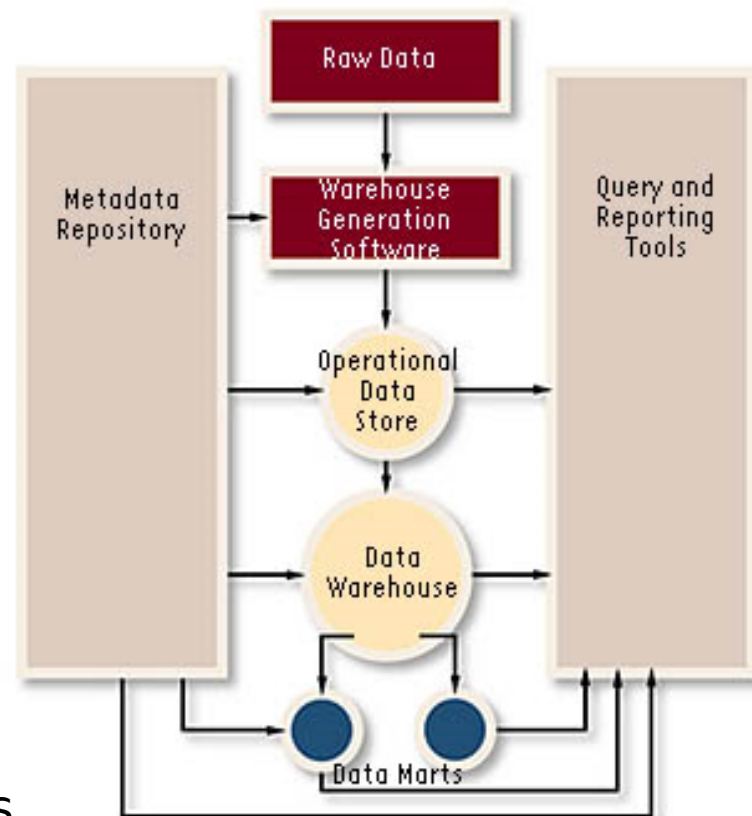
DHSS - The Healthcare Data Warehouse 5,000 Foot View

- **A wide variety of healthcare data**

- Rx, Lab, Rad, etc
- Inpatient Episodes
- Outpatient Encounters
- Survey Data
- Enrollment Data
- Reference Data
- Claims Data

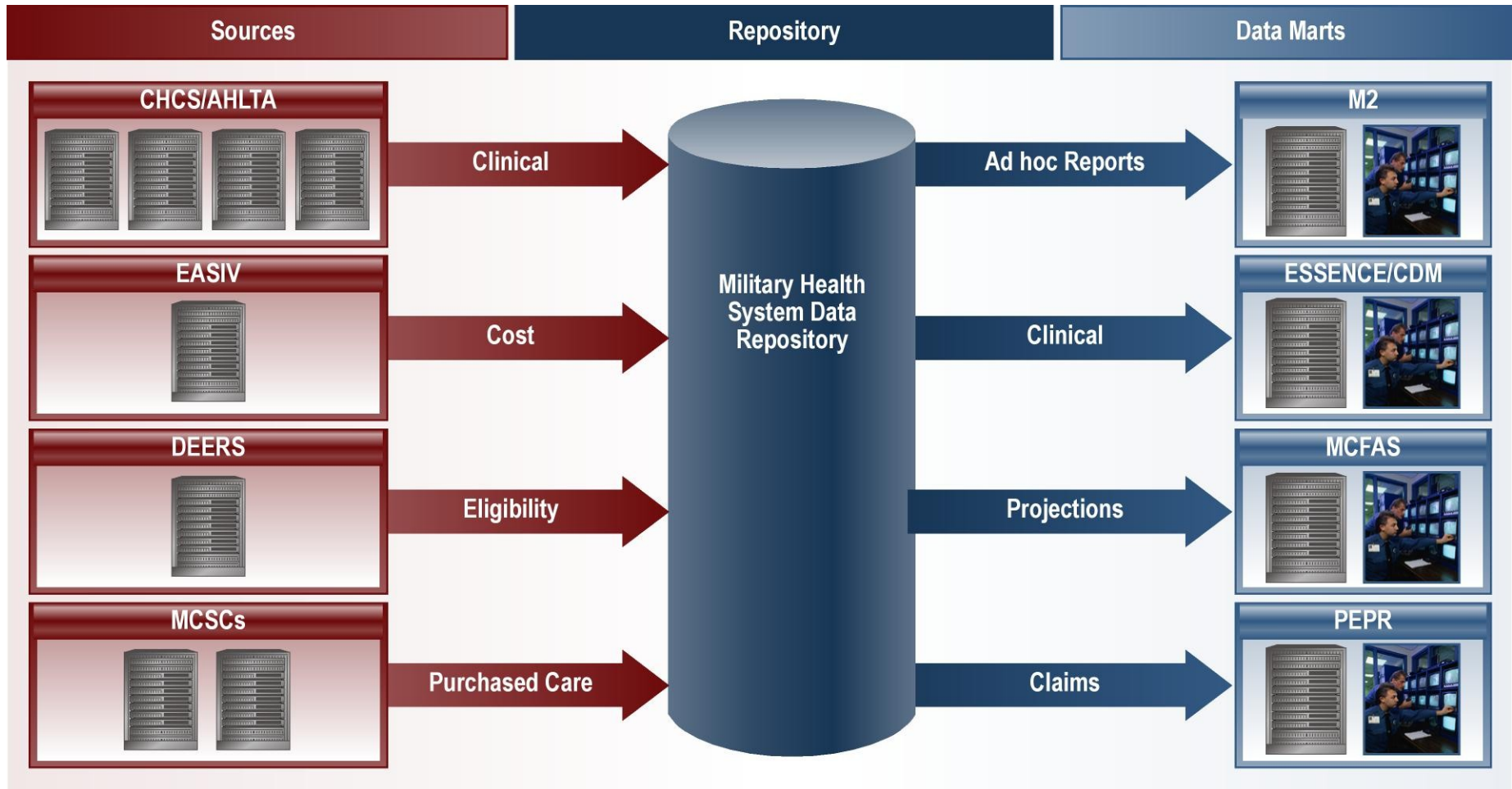
- **Collects and distributes data**

- Daily, weekly, and monthly
- From over 460 freestanding clinics and 100 hospitals
- From thousands of civilian facilities
- Worldwide geographic distribution



DHSS Architecture View

1,000 Foot View

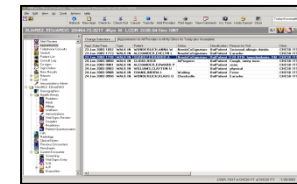
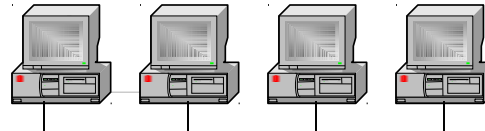


CHCS Host Architecture and DHSS Interfaces



ELIGIBILITY
&
ENROLLMENT

MR. BILLABLE CYCLOPS	ADT Patient Encounter	20100404 1010	ADT-076
Appt IntakeTime: 04 Mar 20020800	Type: APV	Status: WALK-IN	
Client: CDR HHS APV 04	APV: 0404	APV: 0404	
Ref: 04040404040404040404	Ref: 04040404040404040404	Ref: 04040404040404040404	
2nd Provider #2: CDR HHS APV 04	2nd Provider #2: CDR HHS APV 04	2nd Provider #2: CDR HHS APV 04	
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CDM Hosted by
DHSS

CDM

CDR

CLINICAL DATA
REPOSITORY

CHCS Host Patient

Standard Files and Tables (DMIS, ICD-9, CPT/HCPCS, DRG, HIPAA Taxonomy, National Drug Codes, Zip

Site Defined Files and Tables (Hospital Locations, Providers, Users, Formulary, Tests/Procedures)

Application Business Rules

Inpatient Admissions and
Dispositions (PAD)

Outpatient Appointment Scheduling
Managed Care Program (PAS/MCP)

Ambulatory Data
Module (ADM)

Clinical Order Entry and Results Reporting

Laboratory
(LAB)

Radiology
(RAD)

Pharmacy
(PHR)

Consults

Nursing
Orders

Medical Services
Accounting (MSA)

Workload
Assignment Module
(WAM)

CHCS Generic Interface System (GIS) for (HL7) and Electronic Transfer Utility

ADT
(Admit,
Discharge,
Transfer,
other status)

LAB
INSTRUMENTS
CO-PATH
LAB-INTEROP
DBSS
HIV

DIN-PACS
VOICE RAD

PDTS
ATC
BAKER CELL
PYXIS
VOICE REFILL

HL7, M/OBJECTS, OR CUSTOM INTERFACES

AHLTA
ICDB
DHSS
DoD/VA SHARE
CIS/ESSENTRIS
AUDIO CARE

TRANSPORTABLE CPR
TRAC2ES
CAC (Patient Look-Up)
NMIS
CODING EDITOR (CCE)

SFTP DATA TRANSFERS to DHSS and
other Corporate Systems

TRICARE OPS CTR (WWW)
SIDR/SADR/CAPER
EAS/MEPRS
WWW
APPOINTMENTS
ANCILLARY
GCPR Extracts

DHSS HL7
ADT
Capture

DHSS HL7
LAB
Capture

DHSS HL7
RAD Capture

DHSS HL7
PHR Capture

Diagram courtesy of Charlene Colon,

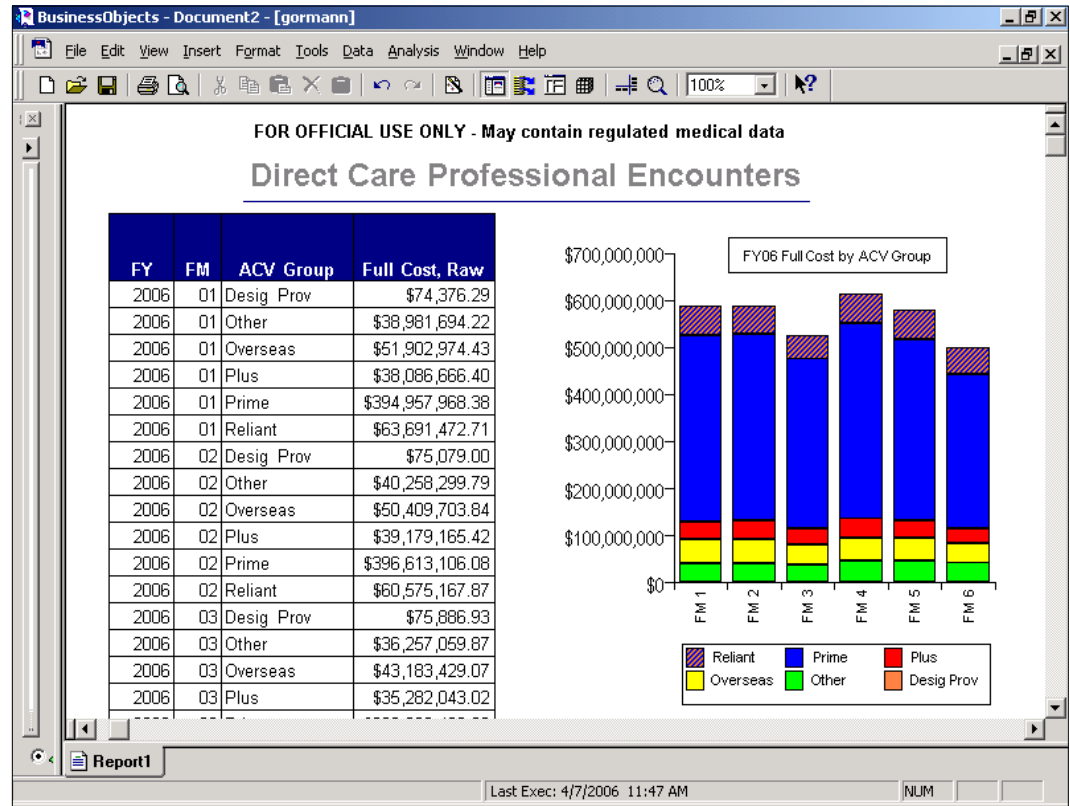
MDR (MHS Data Repository)

- Centralized data capture and validation of MHS data worldwide
- More than 5 billion records on-line with 10+ years of data
- Provides repository for other systems/applications to receive extracts
- Typical users: small cadre of high-level data analysts



M2 (MHS Management Analysis & Reporting Tool)

- Powerful ad hoc query tool for detailed trend analysis such as patient and provider profiling
- Typical users: Data analysts skilled in Business Objects software



DHSS Data Quality Requirements



- Capture and catalog data files
- Assess and monitor data completeness
- Perform data quality assessments (basic validity checks)
- Develop and maintain data quality software that:
 - ✂- Performs automatic data quality checks
 - ✂- Implements data quality assessments
 - ✂- Provides metrics and manages perspective of the files' data quality
 - ✂- Provide feedback on “outliers” to respective services, sites or POC's

DHSS Data Quality Metrics Address:



- Integrity: is it secure?
- Relevancy: is it appropriate?
 - Reliability: is it rationally correlated? (e.g. CAPER vs Appts vs SADR)
 - Validity: is it sound? (e.g. not from TEST MEPRS codes, does it represent a valid encounter)
- Consistency: is it free from contradiction?
 - Uniqueness: is it free from duplication?
- Timeliness: is it available when needed?
 - E.g. What are the lag times from encounter to visibility in datamarts?
- Completeness: is it whole?
 - e.g. truncated/aberrant/malformed
- Accuracy: is it free from error?
 - “Functional” analysis and ingest business

DHSS's Data Quality Tools

- A **Real-time/Run-time** data quality/completeness database for:
 - SIDR SADR CAPER HL7 PDTs Appointment Ancillary Data Types
- Database updated daily and scripted to provide “**event-driven**” alerts via e-mail for critical data quality issues or problems
- For DMIS ID's, “real time” and “snapshot” views of key data completeness measures
- Internal access for standard “canned” Data Quality/Completeness reports
- Multilayer data comparisons from raw to processed data for procedure-based actions
- Multilayer comparisons of related data types (e.g. SADR vs CAPER vs Appt vs WWR vs MEPRS)
- Statistical process control algorithms and control charts

DHSS's "Data Tracker"

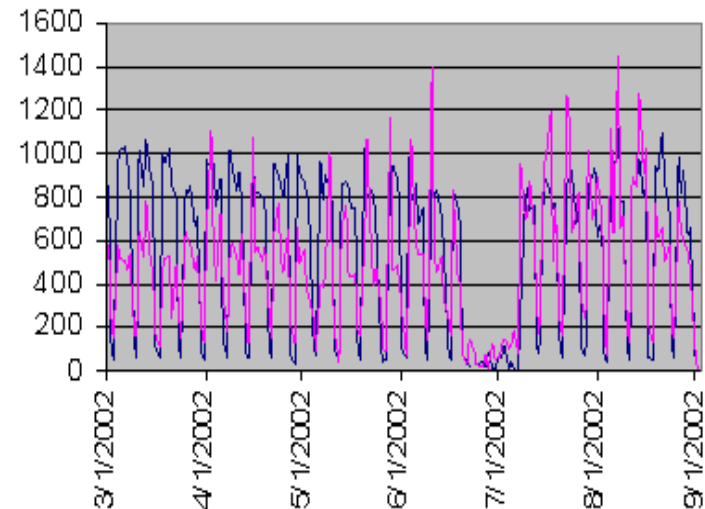
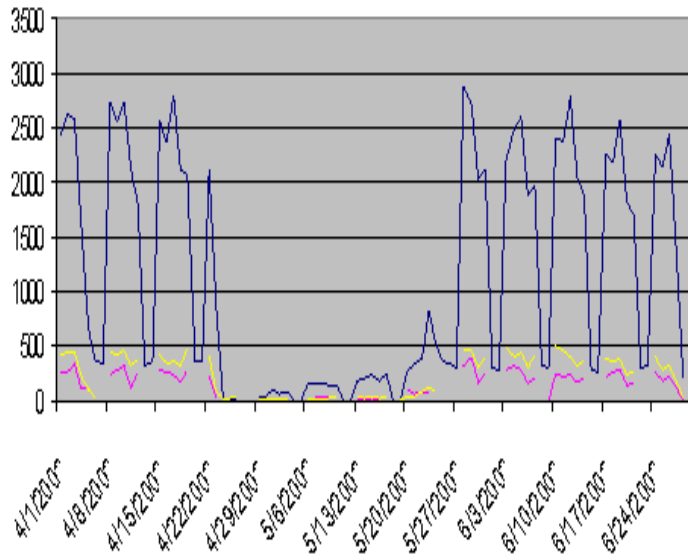
- Essentially a "Mini MDR/M2". Data processed in real time
- Data Tracker tools and reports
 - SIDR, SADR, CAPER, HL7, Appointment, Ancillary, TED Inst/Non-Inst reports provide:
 - File based accounting (e.g. Gap reports)
 - Treatment based accounting (e.g. reports based on care date)
 - Timeliness reporting (e.g. lag from care rendered date to ingest)
 - Other statistical reports including benchmarking against WWR
 - Statistical Process Control Alerting for SADR/CAPER anomalies
 - Other Data Tracker tools and reports
 - Monthly reports (SIDR and SADR/CAPER vs WWR and Appointments - "Benchmarking")
 - Ad Hoc Queries to the Data Tracker
 - Gap Reports - Receipt Reports - Pull Reports
 - Current Data Tracker reports on the DHSS Web site
 - Daily SADR by HOST DMIS (The **"What Was Received Yesterday"** Report)
 - Daily SADR by Treatment ID - 90 Day (The daily **"90 Day Roller"** Report)
 - Monthly SIDR by Treatment DMIS

Basic Data Quality Assurance Tools

Start with Run Charts

Example of facilities showing gaps in daily outpatient encounter data receipt. Investigation and data recovery actions required.

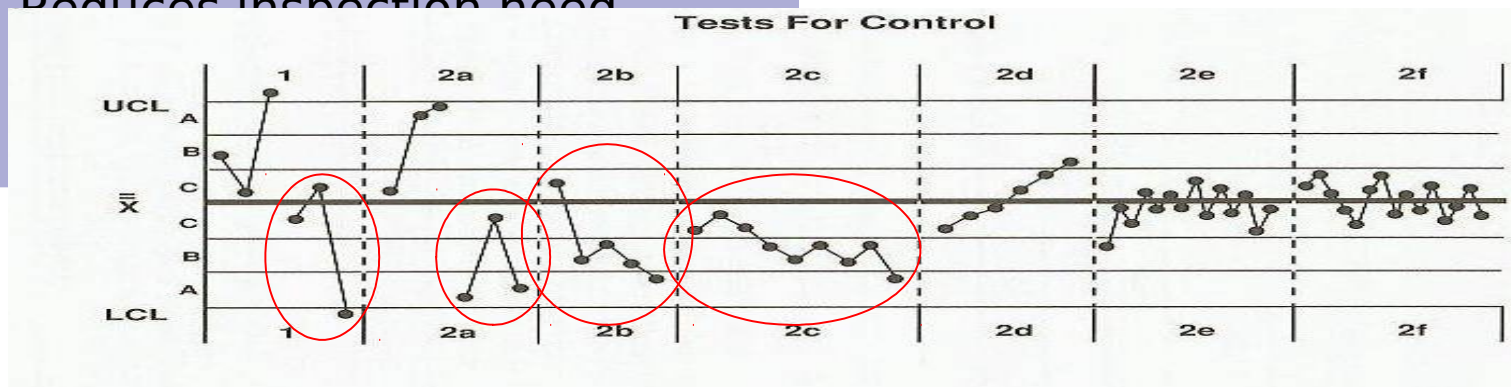
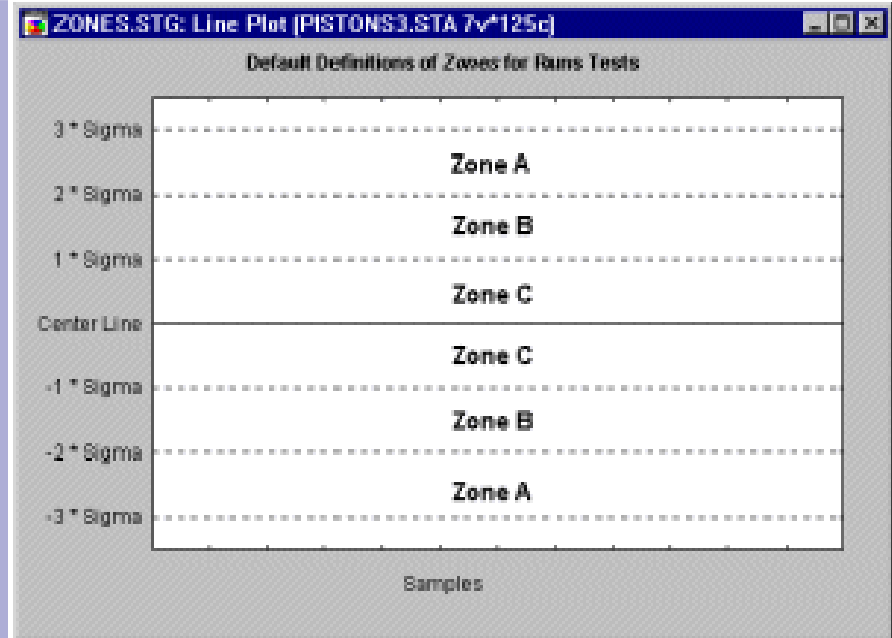
Data set has no correlation with other source system provided data



Data Completeness Determination

“Completeness” as a Process Control Problem

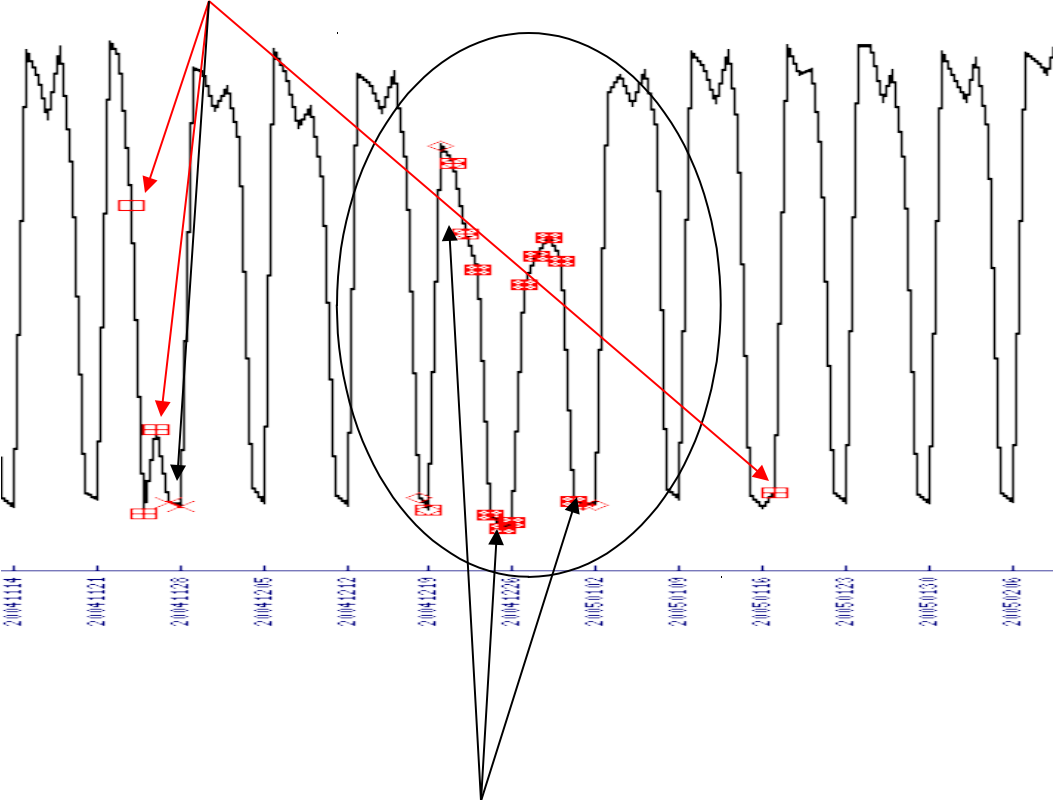
- Amenable to Statistical\Process Control
- Examine for Special Cause Variation
- Signals when a problem has occurred
- Detects variation
- Allows “Process Characterization”
- Reduces inspection need



Project
previous
data to today
then
compare this
projection
with newly
arrived data.

DMIS ID

Red Boxes/X's/etc indicate "Alerts" sent to DQ Team via automated email



Holiday Logic Pending

Chart: Encounters by Day

Identifying Data Completeness Problems

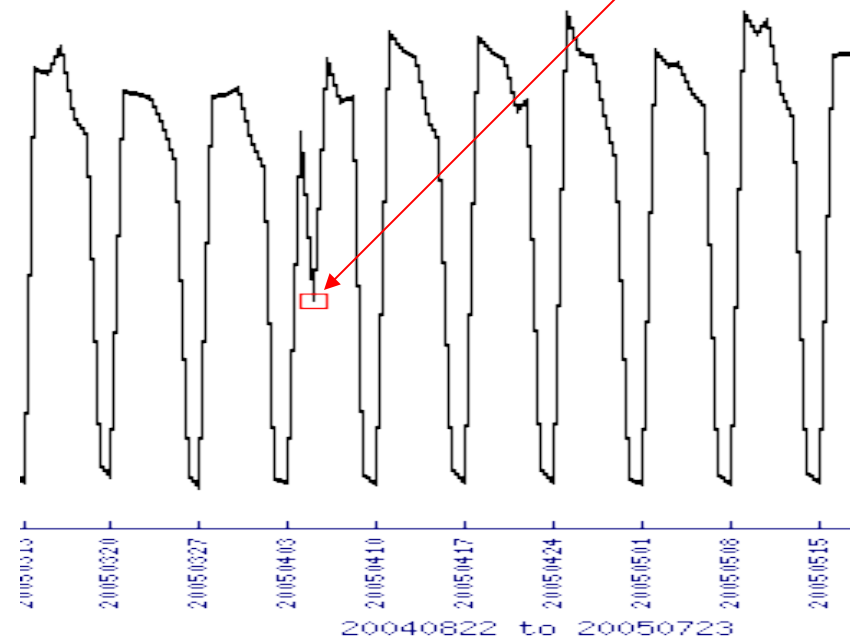


Red boxes/Xs/etc. indicate automatic e-mail “Alerts” to the data quality team.

Alerting and Notification Issue

How do you identify and present “possible” problems when:

- the “problem” is transient,
- it is one data point in a series,
- it is from one of a vast number of daily input data sources?



Essentially a projection of previous data forward in time to today then a comparison of this projection with the newly arrived data.

Data Tracker Report Series including:

- SADR vs Appts vs WWR Tracking (AKA "The Hutchinson Report")
- SADR vs Appointment Delta Alerting

3	A	B	C	F	G	L	M	N	Q	R	S	X	Y	Z	AE	AF	AG	AL	AM			
1						SADR - includes appt inferred - APPTS		Consistency Variable APPT Inferred SADRs as % of All SADRs	SADR - MEPRSCD B		Ext Consistency B MEPR SADR as % of Same Month RAW SADR	SADR		Ext Consistency raw SADR as % of Same Month WWR	WWR		Ext Consistency APPTS (Inferred SADR) as % of Same Month WWR	MEPRS				
2	BRANCH	DMISID	FACILITY	MONTH	ADec10	AJan11	HDec10		HJan11	SDec10		SJan11	WDec10		WJan11	MDec10		MJan11				
1027		0058	Total		205,128	216,203			182,973	192,901			198,745	209,425		107,999	114,667		103,862	112,00		
1028	F	0059	22nd MEDICAL GROUP	Oct-09	6,887	6,887		14.38%	5,857	5,857		99.32%	5,897	5,897		126.57%	4,659	4,659		147.82%	4,652	4,65
1029	F	0059	22nd MEDICAL GROUP	Nov-09	5,679	5,679		10.00%	5,088	5,088		99.55%	5,111	5,111		120.60%	4,238	4,238		134.00%	4,238	4,23
1030	F	0059	22nd MEDICAL GROUP	Dec-09	5,381	5,381		1.17%	5,283	5,283		99.34%	5,318	5,318		117.29%	4,534	4,534		118.68%	4,472	4,47
1031	F	0059	22nd MEDICAL GROUP	Jan-10	6,060	6,060		1.60%	5,934	5,934		99.51%	5,963	5,963		120.12%	4,964	4,964		122.08%	4,918	4,91
1032	F	0059	22nd MEDICAL GROUP	Feb-10	5,726	5,726		1.35%	5,617	5,617		99.43%	5,649	5,649		119.25%	4,737	4,737		120.88%	4,679	4,67
1033	F	0059	22nd MEDICAL GROUP	Mar-10	7,789	7,789		1.70%	7,609	7,609		99.37%	7,657	7,657		119.38%	6,414	6,414		121.44%	6,414	6,41
1034	F	0059	22nd MEDICAL GROUP	Apr-10	7,430	7,430		1.35%	7,281	7,281		99.33%	7,330	7,330		119.79%	6,119	6,119		121.43%	6,119	6,11
1035	F	0059	22nd MEDICAL GROUP	May-10	6,273	6,273		1.31%	6,154	6,154		99.40%	6,191	6,191		124.54%	4,971	4,971		126.19%	4,946	4,94
1036	F	0059	22nd MEDICAL GROUP	Jun-10	6,800	6,799		1.47%	6,633	6,632		99.00%	6,700	6,699		125.00%	5,359	5,359		126.87%	5,359	5,35
1037	F	0059	22nd MEDICAL GROUP	Jul-10	6,083	6,083		1.13%	5,979	5,979		99.18%	6,044	6,044		119.88%	5,385	5,385		124.85%	5,315	5,31
1038	F	0059	22nd MEDICAL GROUP	Aug-10	6,613	6,612		1.41%	6,484	6,484		99.12%	6,549	6,549		120.00%	5,385	5,385		124.85%	5,315	5,31
1039	F	0059	22nd MEDICAL GROUP	Sep-10	6,340	6,340		2.16%	6,141	6,141		97.87%	6,206	6,206		116.64%	5,385	5,385		124.85%	5,315	5,31
1040	F	0059	22nd MEDICAL GROUP	Oct-10	6,052	6,052		1.83%	5,900	5,900		98.16%	5,965	5,965		117.50%	5,385	5,385		124.85%	5,315	5,31
1041	F	0059	22nd MEDICAL GROUP	Nov-10	6,114	6,156		1.82%	5,886	5,886		98.16%	5,965	5,965		117.50%	5,385	5,385		124.85%	5,315	5,31
1042	F	0059	22nd MEDICAL GROUP	Dec-10	727	5,720		1.40%	719	719		98.16%	5,965	5,965		117.50%	5,385	5,385		124.85%	5,315	5,31
1052		0059	Total		89,954	94,987			86,565	86,565		96.23%	87,211	87,211		107.06%	71,712	71,712		137.83%	65,400	65,83
1053	A	0060	BLANCHFIELD ACH	Oct-09	72,945	72,945		2.92%	62,235	62,235		85.33%	63,034	63,034		86.28%	51,712	51,712		137.83%	65,400	63,40
1054	A	0060	BLANCHFIELD ACH	Nov-09	71,171	71,169		2.72%	54,836	54,836		77.20%	55,223	55,223		77.06%	45,263	45,263		142.03%	55,994	55,99
1055	A	0060	BLANCHFIELD ACH	Dec-09	64,285	64,286		2.72%	48,085	48,086		76.89%	62,528	62,535		138.16%	45,263	45,263		142.03%	55,994	55,99
1056	A	0060	BLANCHFIELD ACH	Jan-10	65,178	65,177		2.90%	51,785	51,785		81.82%	63,288	63,290		129.17%	48,999	48,999		133.02%	60,689	60,68
1057	A	0060	BLANCHFIELD ACH	Feb-10	61,970	61,970		2.71%	49,003	49,003		81.27%	60,291	60,293		130.80%	46,095	46,095		134.44%	58,033	58,03
1058	A	0060	BLANCHFIELD ACH	Mar-10	76,743	76,743		2.93%	60,493	60,493		81.21%	74,492	74,492		130.55%	57,062	57,062		134.49%	71,913	71,91
1059	A	0060	BLANCHFIELD ACH	Apr-10	69,665	69,664		2.93%	55,270	55,269		81.73%	67,618	67,621		130.01%	52,012	52,012		133.94%	64,344	64,34
1060	A	0060	BLANCHFIELD ACH	May-10	57,871	57,871		2.91%	44,895	44,895		79.91%	56,185	56,185		131.75%	42,644	42,644		135.71%	50,668	50,66
1061	A	0060	BLANCHFIELD ACH	Jun-10	60,914	60,917		3.07%	46,359	46,362		78.51%	59,045	59,049		136.52%	43,252	43,252		140.84%	52,816	52,81
1062	A	0060	BLANCHFIELD ACH	Jul-10	58,712	58,716		2.96%	45,505	45,509		79.87%	56,972	56,978		132.71%	42,935	42,935		136.76%	52,783	52,78
1063	A	0060	BLANCHFIELD ACH	Aug-10	70,716	70,760		2.90%	54,037	54,080		78.71%	68,654	68,706		134.57%	51,057	51,057		138.59%	60,890	60,89
1064	A	0060	BLANCHFIELD ACH	Sep-10	68,341	68,374		2.68%	51,932	51,961		78.09%	66,498	66,539		136.08%	48,896	48,896		139.84%	58,873	58,87
1065	A	0060	BLANCHFIELD ACH	Oct-10	64,576	64,574		3.05%	49,744	49,744		79.46%	62,580	62,603		136.50%	45,864	45,864		140.79%	55,055	55,05
1066	A	0060	BLANCHFIELD ACH	Nov-10	63,442	63,641		2.71%	49,132	49,223		79.50%	61,618	61,916		136.47%	45,371	45,371		140.27%	54,57	54,57
1067	A	0060	BLANCHFIELD ACH	Dec-10	7,163	52,918		2.70%	5,165	40,193		78.06%	7,163	51,488		133.21%		38,652		136.91%		
1068	A	0060	BLANCHFIELD ACH	Jan-11		258		0.00%		47		18.22%		258								

Sharp increase in the difference between SADR and Appointments.

[Audience Participation: Possible Causes?]

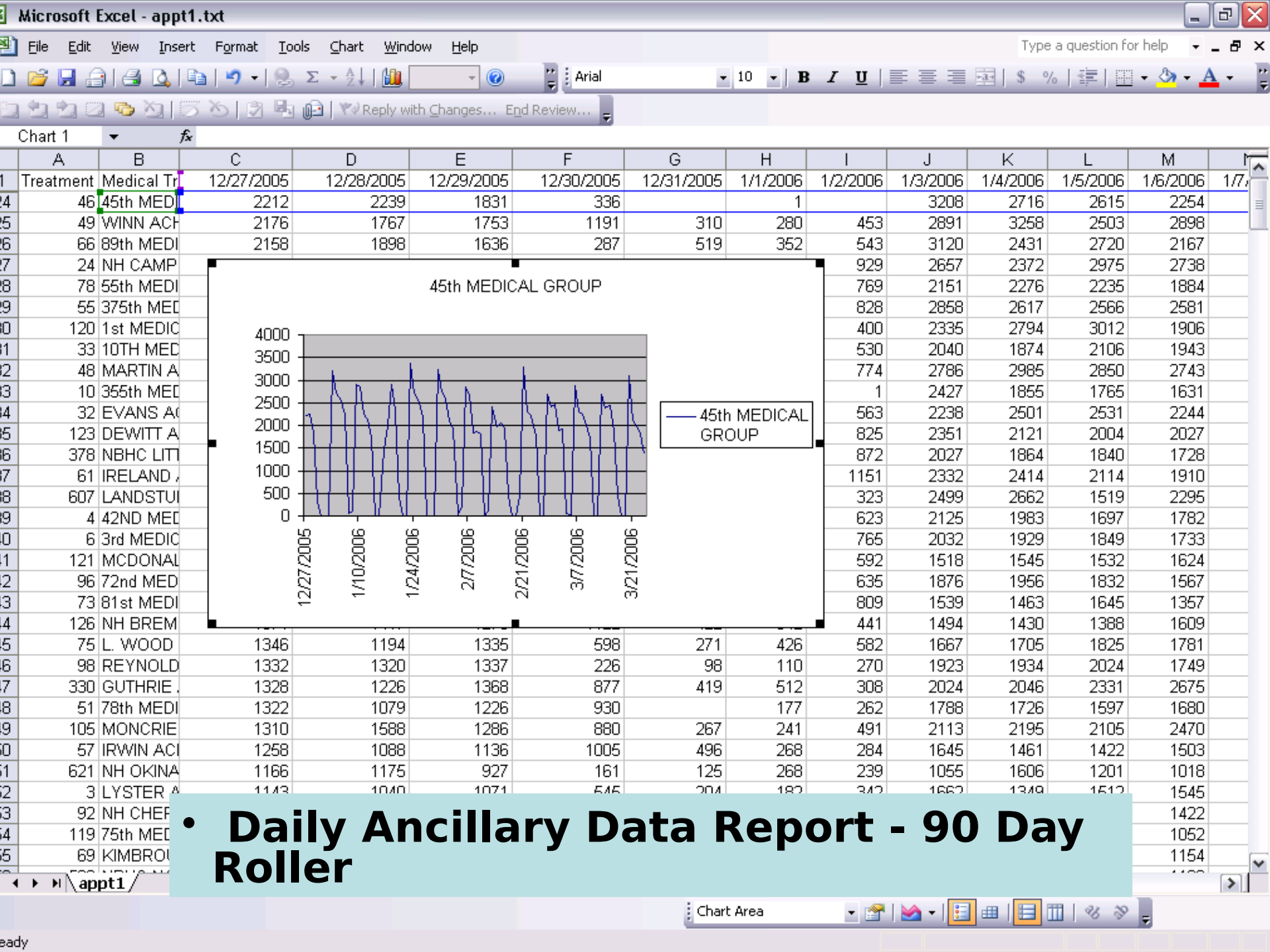
jan11_fy10_fy11_report

homeDSL R 2Internet access

Average: 12.19%Count: 2Sum: 24.38%100%

Sharp increase in the difference between SADR and Appointments.

[Audience Participation: Possible Causes?]



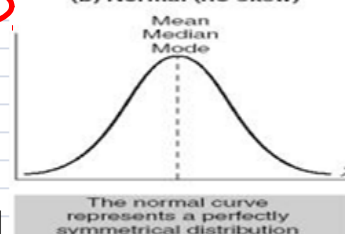
Data Quality Tools – “Encounter Timeliness”

	Medical Treatment Facility	N (# of Encounters)	Mean	Standard Deviation
110	DARNALL AMC	169464	2.94	3.82
125	MADIGAN AMC	169193	4.75	6.74
109	BROOKE AMC	155957	4.35	5.38
89	WOMACK AMC	154777	3.47	4.25
117	59th MEDICAL WING	153855	4.76	5.45
29	NMC SAN DIEGO	145880	6.07	7.8
32	EVANS ACH	144485	3.19	4.06
124	NMC PORTSMOUTH	144467	5.15	7.88
37	WALTER REED ARMY MEDICAL CENTE	142962	3.82	5.93
52	TRIPLER AMC	141958	4.2	4.49
60	BLANCHFIELD ACH	139950	3.09	2.75
47	EISENHOWER AMC	118785	4.12	4.35
67	NNMC BETHESDA	117449	3.92	5.56
98	REYNOLDS ACH	102356	3.01	3.08
61	IRELAND ACH	98378	2.82	2.34
91	NH CAMP LEJEUNE	98277	3.89	6.91
108	WILLIAM BEAUMONT AMC	96737	4.22	5.05
48	MARTIN ACH	89883	2.86	2.27
49	WINN ACH	81377	2.88	2.49
14	60th MEDICAL GROUP	77770	4.44	6.03
75	L. WOOD ACH	73648	2.76	2.45
607	LANDSTUHL REGIONAL MEDCEN	73289	4.09	6.88
24	NH CAMP PENDLETON	73220	3.78	4.96
57	IRWIN ACH	71413	3.02	3.34
123	DEWITT ACH	71154	3.14	3.55
95	88th MEDICAL GROUP	69474	2.69	4.12
6	3rd MEDICAL GROUP	65102	3.7	4.06
330	GUTHRIE AHC	60978	2.83	2.4
42	96th MEDICAL GROUP	59496	3.93	4.17
79	MIKE OCALLAGHAN FEDERAL HOSPITA	58834	3.44	3.77
39	NH JACKSONVILLE	58208	4.18	4.51
64	BAYNE-JONES ACH	56231	2.57	2.89
437	SCHOFIELD BARRACKS AHC	55121	2.49	1.81
120	1st MEDICAL GROUP	54822	3.47	4
73	81st MEDICAL GROUP	53455	3.58	3.56

Site has the most encounters for the time frame. They do well on this metric compared to other large facilities. [Relatively low mean AND standard deviation, recall that 1.0 is the "lowest" obtainable mean, and 2.0 (2 days from encounter to receipt) a more realistic expectation]

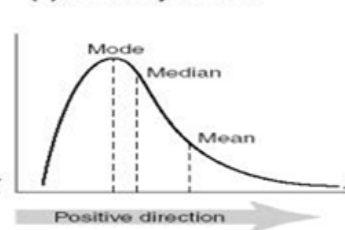
What do THEY do, that the others do not? Why is their Standard Deviation more "Bell Curve" like than others?

(b) Normal (no skew)



Since greater Standard Deviation =s more "Variation", some locations or other factors within the facility must do much better than others.

(c) Positively skewed



Data Quality Reporting – “ER Timeliness”

High Mean

High Standard Deviation

Deviation is worse than High Mean - High Standard Deviation

Why?

Low Std Dev means MOST records come in near the mean.

High Std Dev means (in this example)

DMIS	Medical Treatment Facility	Service	N	Mean	Std
110	DARNALL AMC	A	6614	2.86	2.83
60	BLANCHFIELD ACH	A	6234	4.42	1.65
29	NMC SAN DIEGO	N	5516	20.38	4.51
89	WOMACK AMC	A	5261	2.66	1.56
125	MADIGAN AMC	A	5214	2.24	0.71
32	EVANS ACH	A	4685	3.11	1.24
117	59th MEDICAL WING	F	4647	9.53	7.05
124	NMC PORTSMOUTH	N	4539	38.6	2.02
108	WILLIAM BEAUMONT AMC	A	4279	3.9	2.93
109	BROOKE AMC	A	4147	3.51	2.47
52	TRIPLER AMC	A	4144	4.9	4.55
91	NH CAMP LEJEUNE	N	3701	23.72	15.04
24	NH CAMP PENDLETON	N	3397	2.41	0.72
79	MIKE OCALLAGHAN FEDERAL HOSPITAL	F	3226	4.09	0.9
47	EISENHOWER AMC	A	3073	3.81	1.14
39	NH JACKSONVILLE	N	2972	7.73	3.25
75	L. WOOD ACH	A	2940	2.47	0.64
49	WINN ACH	A	2816	3.36	3.1
57	IRWIN ACH	A	2745	2.51	1.2
48	MARTIN ACH	A	2712	2.74	1.38
6	3rd MEDICAL GROUP	F	2637	6.2	2.96
42	96th MEDICAL GROUP	F	2635	6.31	1.94
98	REYNOLDS ACH	A	2615	2.74	3.02
123	DEWITT ACH	A	2598	3.69	1.41
126	NH BREMERTON	N	2259	2.41	0.79
61	IRELAND ACH	A	2216	3.51	0.99
607	LANDSTUHL REGIONAL MEDCEN	A	2189	2.96	3.56
38	NH PENSACOLA	N	2187	2.85	2.8
621	NH OKINAWA	N	2030	5.17	2.65

Data Quality Tools – “Difference Detectors”

DMIS	Facility Name	FY	FM	Month	CAPER	SADR	CAPER visits / SADR
0208	BMC MCB CAMP PENDLETON	2008	05	Feb-08	2,291	2,290	100.04%
0208	BMC MCB CAMP PENDLETON	2008	06	Mar-08	2,554	2,316	110.28%
0297	NACC NEW ORLEANS	2003	01	Oct-02	.	2,140	0.00%
0297	NACC NEW ORLEANS	2003	02	Nov-02	.	1,999	0.00%
0297	NACC NEW ORLEANS	2003	03	Dec-02	.	1,978	0.00%
0297	NACC NEW ORLEANS	2003	04	Jan-03	.	2,281	0.00%
0297	NACC NEW ORLEANS	2003	05	Feb-03	.	2,114	0.00%
0297	NACC NEW ORLEANS	2003	06	Mar-03	.	2,134	0.00%
0297	NACC NEW ORLEANS	2003	07	Apr-03	.	2,300	0.00%
0297	NACC NEW ORLEANS	2003	08	May-03	.	2,271	0.00%
0297	NACC NEW ORLEANS	2003	09	Jun-03	.	2,192	0.00%
0297	NACC NEW ORLEANS	2003	10	Jul-03	.	1,964	0.00%
0297	NACC NEW ORLEANS	2003	11	Aug-03	.	1,704	0.00%
0297	NACC NEW ORLEANS	2003	12	Sep-03	.	1,715	0.00%
0297	NACC NEW ORLEANS	2004	01	Oct-03	.	1,621	0.00%
0297	NACC NEW ORLEANS	2004	02	Nov-03	.	1,106	0.00%
0297	NACC NEW ORLEANS	2004	03	Dec-03	.	1,658	0.00%
0297	NACC NEW ORLEANS	2004	04	Jan-04	.	1,497	0.00%
0297	NACC NEW ORLEANS	2004	05	Feb-04	.	1,315	0.00%
0297	NACC NEW ORLEANS	2004	06	Mar-04	.	1,417	0.00%
0297	NACC NEW ORLEANS	2004	07	Apr-04	23	1,329	1.73%
0297	NACC NEW ORLEANS	2004	08	May-04	1,095	1,099	99.64%
0297	NACC NEW ORLEANS	2004	09	Jun-04	1,184	1,184	100.00%
0297	NACC NEW ORLEANS	2004	10	Jul-04	1,116	1,116	100.00%
0297	NACC NEW ORLEANS	2004	11	Aug-04	1,116	1,089	102.48%
0297	NACC NEW ORLEANS	2004	12	Sep-04	860	860	100.00%
0297	NACC NEW ORLEANS	2005	01	Oct-04	1,206	1,206	100.00%
0297	NACC NEW ORLEANS	2005	02	Nov-04	1,157	1,158	99.91%
0297	NACC NEW ORLEANS	2005	03	Dec-04	981	986	99.49%
0297	NACC NEW ORLEANS	2005	04	Jan-05	1,156	1,158	99.83%
0297	NACC NEW ORLEANS	2005	05	Feb-05	981	983	99.80%
0297	NACC NEW ORLEANS	2005	06	Mar-05	1,113	1,113	100.00%

[illegible]

Data Quality Tools – “Difference Detectors”

DMISID	FACILITY	FY	FM	MONTH	Appr Inferred	Raw SADR	RAW SADRs - % Less	Ext Consistency raw SADR	WWR
					AApr08	SApr08	than Inferred	as % of Same Month WWR	WApr08
0037	WALTER REED ARMY MEDICAL	2007	02	Nov-06	72,681	70,099	96%	109.74%	63,880
0037	WALTER REED ARMY MEDICAL	2007	03	Dec-06	62,404	60,369	97%	110.57%	54,600
0037	WALTER REED ARMY MEDICAL	2007	04	Jan-07	73,535	71,146	97%	110.88%	64,163
0037	WALTER REED ARMY MEDICAL	2007	05	Feb-07	59,960	57,825	96%	109.53%	52,794
0037	WALTER REED ARMY MEDICAL	2007	06	Mar-07	72,419	69,961	97%	108.13%	64,700
0037	WALTER REED ARMY MEDICAL	2007	07	Apr-07	69,736	67,207	96%	111.18%	60,449
0037	WALTER REED ARMY MEDICAL	2007	08	May-07	73,889	71,046	96%	113.68%	62,496
0037	WALTER REED ARMY MEDICAL	2007	09	Jun-07	69,011	65,868	95%	114.19%	57,684
0037	WALTER REED ARMY MEDICAL	2007	10	Jul-07	64,747	62,396	96%	110.16%	56,640
0037	WALTER REED ARMY MEDICAL	2007	11	Aug-07	69,316	66,869	96%	117.63%	56,848
0037	WALTER REED ARMY MEDICAL	2007	12	Sep-07	62,279	58,674	94%	125.49%	46,756
0037	WALTER REED ARMY MEDICAL	2008	01	Oct-07	78,299	73,914	94%	123.55%	59,824
0037	WALTER REED ARMY MEDICAL	2008	02	Nov-07	69,506	66,624	96%	119.48%	55,761
0037	WALTER REED ARMY MEDICAL	2008	03	Dec-07	57,473	54,954	96%	118.20%	46,491
0037	WALTER REED ARMY MEDICAL	2008	04	Jan-08	75,470	62,533	83%	99.77%	62,679
0037	WALTER REED ARMY MEDICAL	2008	05	Feb-08	68,328	65,453	96%	117.01%	55,939
0037	WALTER REED ARMY MEDICAL	2008	06	Mar-08	62,227	62,227	100%	105.35%	59,066

Data Quality Tools – “Interface Monitoring”

Map of CHCS Sending Facilities to EIDS Operations Site ID and DMIS ID				Msg Receipts at EIDS - March 2008 - By Sending Application							
CHCS Sending Facility	EIDS Ops Site ID	DMIS ID	Medical Treatment Facility	Service	IV	LAB AP	LAB CH	LAB MI	MED	RAD	RX
A1411	0110	0110	DARNALL ACH-FT. HOOD	A	Y	Y	Y	Y	Y	Y	Y
HP0125	0125	0125	MADIGAN AMC-FT. LEWIS	A	Y	Y	Y	Y	Y	Y	Y
A1631	0131	0131	WEDD ACH-FT. IRWIN	A	Y	Y	Y	Y	Y	Y	Y
HP0330	0330	0330	GUTHRIE AHC-FT. DRUM	A	N	Y	Y	Y	N	Y	Y
HP0607	0607	0607	LANDSTUHL REGIONAL MEDCEN	A	Y	Y	Y	Y	Y	Y	Y
A0611	0612	0612	121st GEN HOSP-SEOUL	A	Y	Y	Y	Y	Y	Y	Y
N68094	0024	0024	NH CAMP PENDLETON	N	Y	Y	Y	Y	Y	Y	Y
N66095	0028	0028	NH LEMOORE	N	Y	Y	Y	Y	Y	Y	Y
N00259	0029	0029	NMCC SAN DIEGO	N	Y	Y	Y	Y	Y	Y	Y
HP0035	0035	0035	NACC GROTON	N	Y	Y	Y	Y	N	Y	Y
N00203	0038	0038	NH PENSACOLA	N	Missing 14-23 Mar	Missing 14-23 Mar	Missing 14-23 Mar	Missing 14-23 Mar	Missing 14-23 Mar	Missing 14-23 Mar	Missing 14-23 Mar
N00232	0039	0039	NH JACKSONVILLE	N	Y	Y	Y	Y	Y	Y	Y
N00211	0056	0056	NH GREAT LAKES	N	N	Y	Y	Y	N	Y	Y
HP0091	0091	0091	NH CAMP LEJEUNE	N	Y	Y	Y	Y	Y	Y	Y
N68084	0103	0103	NH CHARLESTON	N	Y	Y	Y	Y	Y	Y	Y
N00118	0118	0118	NH CORPUS CHRISTI	N	N	Y	Y	Y	N	Y	Y
N00183	0124	0124	NMCC PORTSMOUTH	N	Y	Y	Y	Y	Y	Y	Y
HP0615	0615	0615	NH GUANTANAMO BAY	N	Y	Y	Y	Y	Y	Y	Y
HP0616	0616	0616	NH ROOSEVELT ROADS-CEIBA	N	N	N	N	N	N	N	Y
N66096	0617	0617	NH NAPLES	N	Y	Y	Y	Y	Y	Y	Y
HP0618	0618	0618	NH ROTA	N	Y	Y	Y	Y	Y	Y	Y
N68096	0620	0620	NH GUAM-AGANA	N	Y	Y	Y	Y	Y	Y	Y
N68470	0621	0621	NH OKINAWA	N	Y	Y	Y	Y	Y	Y	Y
HP0622	0622	0622	NH YOKOSUKA	N	Y	Y	Y	Y	Y	Y	Y
N68875	0623	0623	NH KEFLAVIK	N	N	N	N	N	N	N	N
N39163	0624	0624	NH SIGONELLA	N	Y	Y	Y	Y	Y	Y	Y
HP1170	1170	1170	BMC NSA SAHRAIN	N	N	Y	Y	Y	N	Y	Y
F0155	0004	0004	42ND MEDICAL GROUP-MAXWELL	F	N	Y	Y	Y	N	Y	Y
F0252	0006	0006	3rd MED GRP-ELMENDORF	F	Y	Y	Y	Y	Y	Y	Y
F0452	0009	0009	56th MED GRP-LIKE	F	Y	Y	Y	Y	N	Y	Y
F0451	0010	0010	355th MED GRP-DAVIS MONTHAN	F	N	Y	Y	Y	N	Y	Y
F0553	0013	0013	314th MED GRP-LITTLE ROCK	F	N	Y	Y	Y	N	Y	Y
HP0014	0014	0014	60th MED GRP-TRAVIS	F	Y	Y	Y	Y	Y	Y	Y
F0670	0018	0018	30th MED GRP-VANDENBERG	F	N	Y	Y	Y	N	Y	Y
F0654	0019	0019	95th MED GRP-EDWARDS	F	N	Y	Y	Y	N	Y	Y
F1051	0036	0036	436th MED GRP-DOVER	F	N	Y	Y	Y	Y	Y	Y
HP0042	0042	0042	96th MED GRP-EGLIN	F	Missing 1-28 Mar	Missing 1-28 Mar	Missing 1-28 Mar	Missing 1-28 Mar	Missing 1-28 Mar	Missing 1-28 Mar	Missing 1-28 Mar
HP0043	0043	0043	325th MED GRP-TYNDALL	F	N	Y	Y	Y	N	Y	Y
HP0045	0045	0045	6th MED GRP-MACDILL	F	Y	Y	Y	Y	N	Y	Y
F1256	0046	0046	45th MED GRP-PATRICK	F	N	Y	Y	Y	N	Y	Y
F1355	0050	0050	347th MED GRP-MOODY	F	N	Missing 1-6 Mar	Missing 1-6 Mar	Missing 1-6 Mar	N	Missing 1-6 Mar	Missing 1-6 Mar
F1356	0051	0051	78th MED GRP-ROBINS	F	N	Y	Y	Y	N	Y	Y
F1651	0053	0053	366th MED GRP-MOUNTAIN HOME	F	Y	Y	Y	Y	Y	Y	Y
HP0055	0055	0055	375th MED GRP-SCOTT	F	N	Y	Y	Y	N	Y	Y
F2057	0059	0059	22nd MED GRP-MCCONNELL	F	N	Y	Y	Y	N	Y	Y
HP0062	0062	0062	2nd MED GRP-BARKSDALE	F	N	Y	Y	Y	N	Y	Y
F2353	0073	0073	31st MED GRP-KEESLER	F	Y	Y	Y	Y	Y	Y	Y
F2351	0074	0074	14th MED GRP-COLUMBUS	F	N	Y	Y	Y	N	Y	Y
F2954	0076	0076	509th MED GRP-WHITEMAN	F	N	Y	Y	Y	N	Y	Y
F3051	0077	0077	341st MED GRP-MALMSTROM	F	N	N	Rcvd 4 Mar only	Rcvd 4 Mar only	N	Rcvd 4 Mar only	Rcvd 4 Mar only
HP0078	0078	0078	55th MED GRP-OFFUTT	F	Y	Y	Y	Y	N	Y	Y
F3251	0079	0079	39th MED GRP-O'CALLAGHAN HOSP	F	Y	Y	Y	Y	Y	Y	Y
F3552	0083	0083	377th MED GRP-KIRTLAND	F	N	N	N	N	N	N	Y
HP0084	0084	0084	49th MED GRP-HOLLOWAY	F	N	Y	Y	Y	N	Y	Y
F3554	0085	0085	27th MED GRP-CANYON	F	N	Y	Y	Y	N	Y	Y
FJA56	0639	0639	35th MED GRP-MISAWA	F	Y	Y	Y	Y	Y	Y	Y
FIT52	0808	0808	31st MED GRP-AVIANO	F	Y	Y	Y	Y	Y	Y	Y
HP0130	aka	0130	USCG CLINIC KODIAK, AK	C	N	N	Y	Y	N	N	Y
HP0416	cen	0416	MOBILE USCG CLINIC	C	N	N	Y	Y	N	Y	Y
HP0428	eas	0428	CAPE MAY COAST GUARD CLINIC	C	N	N	Y	Y	N	N	Y
HP7043	hia	7043	HONOLULU COAST GUARD CLINIC	C	Test Site	Test Site	Test Site	Test Site	Test Site	Test Site	Test Site
HP0067	ncac	0067	NMCC BETHESDA, MD	N	Y	Y	Y	Y	Y	Y	Y
HP0418	pac	0418	ALAMEDA COAST GUARD CLINIC	C	N	N	Y	Y	N	N	Y
HP7042	pra	7042	BORINGEN COAST GUARD CLINIC	C	N	N	Y	Y	N	N	Y

Data Quality Processes

Problem Determination

From: admtrak.edwn11_sw@iris.den.disa.mil [mailto:admtrak.edwn11_sw@iris.den.disa.mil]
Sent: Monday, July 30, 2007 11:08 AM
Subject: SADR Gaps

SADR Gaps on 07/29/2007 as of 07/30/2007

Site ID,	Medical Treatment Facility,	Days Missing,	Host,
KAFB0038,	NH PENSACOLA,	4,	edwn35_sw,
KAFB0073,	81st MEDICAL GROUP,	4,	edwn35_sw,
KAFB0316,	NBHC GULFPORT,	4,	edwn35_sw,
KAFB0436,	KGADS,NBHC NAS BELLE CHASE,	4,	edwn35_sw,
KAFB0654,	KGADS,NBHC PASCAGOULA,	4,	edwn35_sw,
KAFB1990,	KGADS,BMC NAVSUPPACT EBANK,	4,	edwn35_sw,

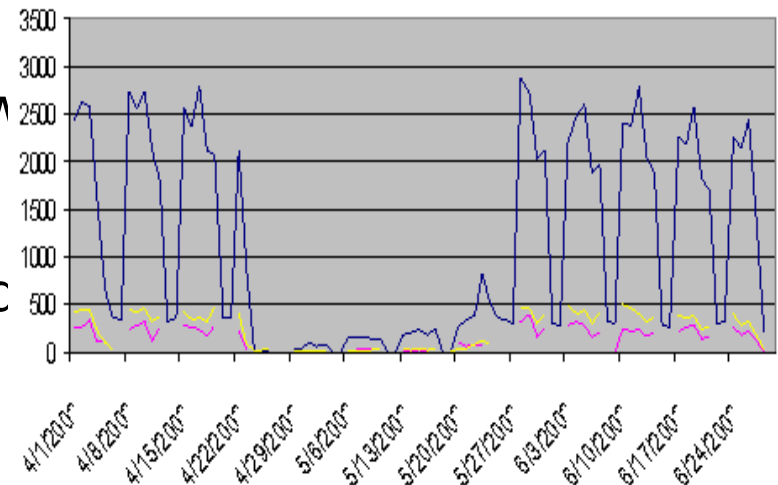
“File Level” Gaps

- Automated Process
 - e.g. Nothing received as of date
- SADR/CAPER Example
 - Nothing received in >2 days – Email Alert includes Service POCs)

Note Files contain data from many encounter dates. **Files may be received daily, but these files may not correlate with CURRENT data]**

“Encounter Date” Analysis

- Monthly and ad hoc manual review
- e.g. Run Charts
- NOTE: SPC Control Charts are designed to provide an automated means to perform this activity)



"Non Receipt" Triggers Monthly Analysis

	1/28/2010	1/28/2010	1/29/2010	1/29/2010	1/30/2010	2/4/2010	2/4/2010	2/5/2010	2/5/2010	2/6/2010	2/14/2010	2/15/2010	2/15/2010	2/16/2010	2/16/2010	2/17/2010	2/17/2010	2/18/2010	2/18/2010	2
Medical Treatment Facility	Files	Records	Files	Records	Files	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Fi
LYSTER AHC	1	1049	1	862	1	1	1000	1	803	1										
14th MEDICAL GROUP	1	168	1	177	1	1	140	1	230	1	24	1	19							
BASSETT ACH	1	1190	1	1109	1	1	936	1	1298	1	245	1	340							
FT. GREELY AHC	1	1	1	1	1	1	8	1	22	1	1	1	1							
354th MEDICAL GROUP	1	156	1	177	1	1	153	1	152	1	1	1	1							
FAIRBANKS MEMORIAL HOSPITAL (1	1	1	1	1	1	1	1	1	1	1	1	1							
COMBINED MEDICAL SVCS CLIN-FT.	1	114	1	120	1	1	109	1	176	1	7	1	10							
KAMISH CLINIC-FT. WAINWRIGHT	1	147	1	127	1	1	163	1	192	1	1	1	1							
97th MEDICAL GROUP	1	69	1	5	1			2	2	1	1	1	25	1	197	1	170	1	279	
EVANS ACH	1	6711	1	4775	1	1	5106				2	277	1	333	1	4974	1	5720	1	7148
10TH MEDICAL GROUP	1	1644	1	1244	1	1	1326				2	76	1	83	1	1251	1	1516	1	1646
21st MEDICAL GROUP	1	403	1	538	1	1	943				2	37	1	27	1	717	1	778	1	900
CIV EMP HLTH CLINIC-PUEBLO	1	9	1	21	1	1	18				2	1	1	1	1	13	1	14	1	15
PREMIER ARMY HEALTH CLINIC	1	292	1	185	1	1	213				2	1	1	19	1	229	1	199	1	262
460th MED GRP-BUCKLEY AFB	1	498	1	173	1	1	327				2	1	1	1	1	473	1	543	1	356
TMC 10-FT. CARSON	1	478	1	378	1	1	172				2	2	1	14	1	217	1	188	1	278
TMC 9-FT. CARSON	1	462	1	324	1	1	256			2	3	1	12	1	310	1	314	1	329	
WARRIOR CLINIC-FT. CARSON	1	472	1	316	1	1	254			2	2	1	3	1	266	1	281	1	363	

List of Problem Facilities - AUTOMATED IDENTIFICATION USING STATISTICAL PROCESS CONTROL ALGORITHMS

Human Interpretation: 2 files after one day gap and volume appears consistent with prior "same days"

STATISTICAL PROCESS CONTROL - Determines that volume for X days is NOT consistent with prior data

SPC AND File Absence Alerting

Data Quality Processes



Problem Resolution Process : IF “file level” OR “encounter date level” problem detected:

- Immediate MHS Help Desk Ticket
- Notification if problem is deemed “significant and or long standing”
- Determination if “Blaster” message to analytical community is appropriate or required. Note that individual site “transient” halts in transmission occur regularly and are usually resolved quickly. These “transient” problems are not reported in real time as M2 utilizes a batch process and problems are often resolved between batch processing cycles.
- Coordination with “Service POCs” to determine if problem also exists in “Service” databases.
- Recovery of files via sharing between service databases and DHSS
- Tier III recovery/reharvest of missing data (except HL7 and Ancillary as no reharvest mechanism exists)

Data Quality Processes



Common Problems - In Order of Occurrence

4 Broad Categories

- Provider/Coding Issues
 - “Slow Coding” from the data receipt perspective (as compared to other like facilities)
 - Provider “left”
- Transmission/Send of Data
 - Sy_ETU Problems
 - Host Issues (e.g. Change Package induced problems)
- Network Routing Issues
- Ingest or Processing (e.g. DHSS downtime – very rare)

DHSS's Tools Improve MHS Data Quality



And allow DHSS to

Catalog data files

Monitor data completeness

Provide metrics to assess data quality/completeness of data received

Design, develop and maintain data quality software

The Key To Data Quality Success

Two horizontal lines with arrows pointing in opposite directions, one above the other, spanning the width of the slide.

Partnering with our users to
maximize information
sharing

Questions?